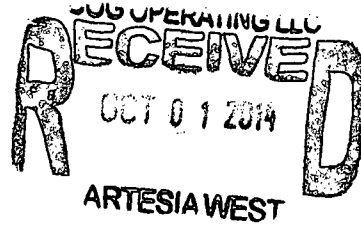




McVAY DRILLING COMPANY
P.O. Box 2450
Hobbs, New Mexico 88241
(575) 397-3311
FAX: 39-DRILL

15- 42518



Well Name and Num: Dump Yard 2 State #2H
Location: Sec 2, T21S, R28E
Operator: COG
Drilling Contractor: McVay Drilling Company

The undersigned certifies that he is an authorized representative of the drilling contractor who drilled the above described well and that he has conducted deviation tests and obtained the following results:

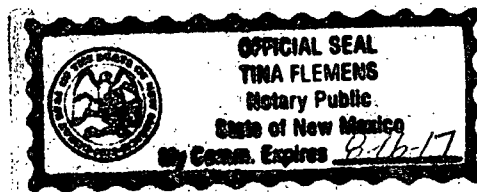
<u>Degrees @</u>	<u>Depth</u>	<u>Degrees @</u>	<u>Depth</u>	<u>Degrees @</u>	<u>Depth</u>	<u>Degrees @</u>	<u>Depth</u>
0.74	409	0.70	6417	90.80	10827	87.20	14356
1.22	548	1.20	6891	90.60	11305	89.60	14546
0.50	783	0.70	7366	89.50	11879	91.20	14784
0.40	1342	1.10	7810	88.80	12293		
0.10	1732	2.22	8353	89.40	12456		
0.30	2236	1.10	7594	90.50	12545		
0.30	2473	1.40	7626	91.80	12734		
0.30	2880	4.60	7689	94.30	12829		
0.10	2996	26.90	7975	94.80	12925		
4.60	3281	47.70	8227	93.50	13117		
4.80	3566	71.70	8512	89.70	13308		
3.10	4042	88.40	8680	91.50	13595		
3.50	4517	91.10	8820	90.20	13691		
4.40	4992	91.50	9574	89.90	13882		
1.50	5372	90.90	9966	86.50	14076		
1.70	5467	90.50	10253	87.80	14167		
0.20	5942	89.70	10731	88.40	14262		

NM OIL CONSERVATION
ARTESIA DISTRICT
JAN 21 2015
RECEIVED

By: Hunter Crowl

Subscribed and sworn to before me this 29th day of September, 2014

Tina Flemens
Notary Public, Lea County, New Mexico





September 5, 2014

Concho Resources, Inc.
One Concho Center
600 W. Illinois Avenue
Midland, Texas 79701

NM OIL CONSERVATION

ARTESIA DISTRICT

JAN 21 2015

RECEIVED

Attn: Kanicia Castillo

RE: Dump Yard 2 State No. 002H

Please find enclosed a copy of the survey from 0.00' to 6100.00' ran on the above referenced well.

Sincerely,

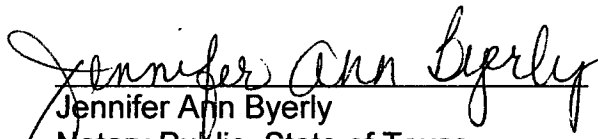

Keith Havelka
Operations

STATE OF TEXAS §

§

COUNTY OF NUECES §

This instrument was acknowledged before me on the 5 day of September A.D., 2014, by Keith Havelka.


Jennifer Ann Byerly
Notary Public, State of Texas

VES Survey International

P.O. Box 261021 Corpus Christi, TX 78426

T (361) 767-0602 F (361) 767-0612

www.vessurvey.com

Company: COG Operating, LLC (Concho)

Lease/Well: Dump Yard 2 State/No. 002H



Rig Name: McVay 6

State/County: New Mexico/Eddy

Latitude: 32.50, Longitude: -104.06

GRID North is 0.15 Degrees East of True North

VS-Azi: 0.00 Degrees



Depth Reference : RKB=18.1 ft

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: gyrosurvey_mrg 6100'.ut

Minimum Curvature Method

Report Date/Time: 9/4/2014 / 11:36

VES Survey International

West Texas

(432) 563-5444

Surveyor: Adam Gathright

Dump Yard 2 State No. 002H / API 30-015-42518

RECEIVED
JAN 21 2015
ARTESIA DISTRICT
NM OIL CONSERVATION

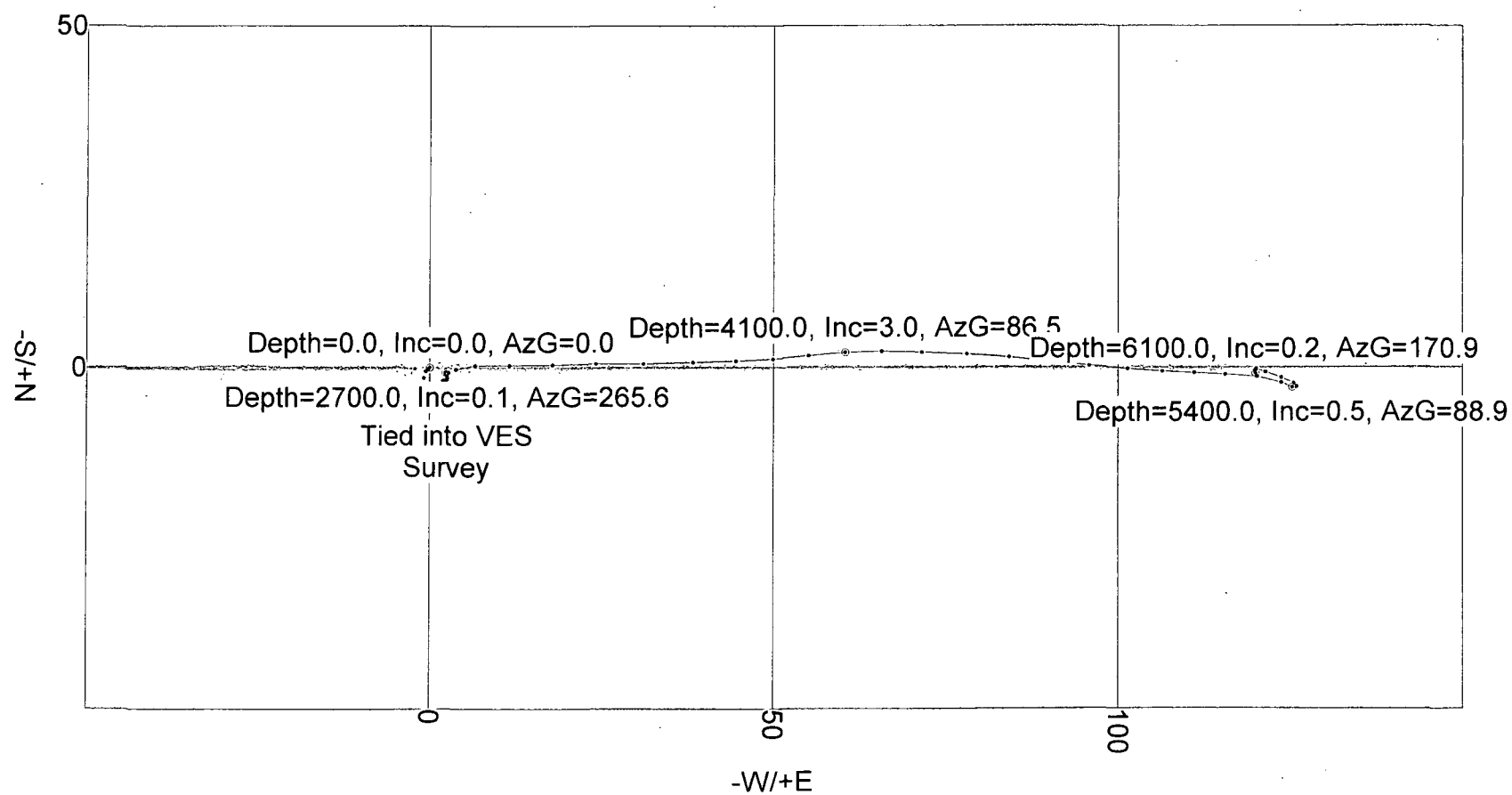
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.20	226.38	100.00	-0.12	-0.12	-0.12	0.17	226.38	0.20
200.00	0.06	75.15	200.00	-0.22	-0.20	-0.22	0.30	221.98	0.25
300.00	0.03	220.42	300.00	-0.23	-0.17	-0.23	0.29	216.60	0.08
400.00	0.51	233.58	400.00	-0.52	-0.55	-0.52	0.75	226.73	0.49
500.00	0.81	174.31	499.99	-1.49	-0.84	-1.49	1.71	209.46	0.70
600.00	1.03	123.25	599.98	-2.68	-0.02	-2.68	2.68	180.44	0.81
700.00	0.38	138.62	699.97	-3.42	0.95	-3.42	3.55	164.53	0.67
800.00	0.11	117.15	799.97	-3.71	1.25	-3.71	3.91	161.40	0.28
900.00	0.12	214.73	899.97	-3.84	1.27	-3.84	4.04	161.66	0.17
1000.00	0.07	230.59	999.97	-3.97	1.16	-3.97	4.13	163.66	0.05
1100.00	0.32	358.23	1099.97	-3.73	1.10	-3.73	3.89	163.52	0.37
1200.00	0.46	55.57	1199.97	-3.23	1.43	-3.23	3.53	156.11	0.40
1300.00	0.44	23.83	1299.97	-2.64	1.92	-2.64	3.27	144.02	0.25
1400.00	0.11	300.47	1399.97	-2.24	2.00	-2.24	3.00	138.33	0.44
1500.00	0.17	355.80	1499.97	-2.05	1.91	-2.05	2.80	137.08	0.14
1600.00	0.13	87.53	1599.96	-1.90	2.01	-1.90	2.76	133.38	0.22
1700.00	0.04	112.35	1699.96	-1.90	2.15	-1.90	2.87	131.52	0.10
1800.00	0.08	101.40	1799.96	-1.93	2.25	-1.93	2.96	130.63	0.05

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg. Severity Deg/100
1900.00	0.15	77.99	1899.96	-1.92	2.45	-1.92	3.11	128.07	0.08
2000.00	0.15	20.20	1999.96	-1.77	2.62	-1.77	3.16	124.00	0.14
2100.00	0.14	0.51	2099.96	-1.53	2.67	-1.53	3.07	119.80	0.05
2200.00	0.24	338.23	2199.96	-1.22	2.59	-1.22	2.86	115.17	0.12
2300.00	0.12	11.47	2299.96	-0.93	2.54	-0.93	2.70	110.05	0.15
2400.00	0.10	278.44	2399.96	-0.81	2.47	-0.81	2.60	108.18	0.16
2500.00	0.12	3.49	2499.96	-0.69	2.39	-0.69	2.49	106.10	0.15
2600.00	0.07	153.72	2599.96	-0.64	2.43	-0.64	2.51	104.79	0.19
Tied into VES Survey									
2700.00	0.09	265.59	2699.96	-0.71	2.38	-0.71	2.48	106.50	0.13
2800.00	0.27	155.23	2799.96	-0.93	2.41	-0.93	2.58	111.12	0.32
2900.00	0.22	38.09	2899.96	-1.00	2.63	-1.00	2.81	110.80	0.42
3000.00	0.22	58.68	2999.96	-0.75	2.91	-0.75	3.00	104.38	0.08
3100.00	1.07	65.06	3099.95	-0.25	3.92	-0.25	3.93	93.66	0.85
3200.00	2.15	85.27	3199.91	0.30	6.64	0.30	6.65	87.43	1.21
3300.00	3.58	92.02	3299.79	0.34	11.63	0.34	11.64	88.32	1.47
3400.00	3.58	86.65	3399.59	0.41	17.87	0.41	17.88	88.67	0.34
3500.00	3.70	90.21	3499.39	0.59	24.21	0.59	24.22	88.62	0.26
3600.00	4.24	90.18	3599.15	0.56	31.14	0.56	31.15	88.97	0.54
3700.00	4.02	86.75	3698.89	0.75	38.34	0.75	38.35	88.88	0.33
3800.00	3.16	89.50	3798.69	0.97	44.59	0.97	44.60	88.75	0.88
3900.00	2.94	85.15	3898.55	1.21	49.90	1.21	49.92	88.61	0.31
4000.00	3.05	83.87	3998.41	1.71	55.11	1.71	55.13	88.22	0.12
4100.00	3.04	86.49	4098.27	2.16	60.40	2.16	60.43	87.95	0.14
4200.00	3.03	89.68	4198.13	2.34	65.68	2.34	65.73	87.96	0.17
4300.00	3.63	92.61	4297.96	2.21	71.49	2.21	71.52	88.23	0.63
4400.00	3.88	91.90	4397.75	1.95	78.03	1.95	78.06	88.57	0.26
4500.00	3.25	97.49	4497.55	1.47	84.23	1.47	84.24	89.00	0.72
4600.00	3.33	95.61	4597.39	0.82	89.93	0.82	89.94	89.48	0.13
4700.00	3.47	94.86	4697.21	0.28	95.84	0.28	95.84	89.83	0.15
4800.00	2.89	95.68	4797.06	-0.23	101.37	-0.23	101.37	90.13	0.59
4900.00	2.82	92.21	4896.94	-0.57	106.33	-0.57	106.33	90.31	0.19
5000.00	2.50	92.89	4996.83	-0.78	110.96	-0.78	110.96	90.40	0.32
5100.00	2.68	93.53	5096.73	-1.03	115.47	-1.03	115.47	90.51	0.18
5200.00	2.60	94.71	5196.62	-1.36	120.07	-1.36	120.07	90.65	0.09
5300.00	1.62	119.86	5296.55	-2.25	123.56	-2.25	123.58	91.04	1.33
5400.00	0.45	88.89	5396.53	-2.95	125.17	-2.95	125.21	91.35	1.25

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
5500.00	0.32	70.70	5496.53	-2.85	125.83	-2.85	125.86	91.30	0.18
5600.00	0.89	300.59	5596.53	-2.36	125.42	-2.36	125.44	91.08	1.13
5700.00	1.45	292.03	5696.51	-1.49	123.57	-1.49	123.58	90.69	0.58
5800.00	1.34	285.54	5796.48	-0.70	121.27	-0.70	121.27	90.33	0.19
5900.00	0.26	294.46	5896.47	-0.29	119.94	-0.29	119.94	90.14	1.08
6000.00	0.29	172.36	5996.47	-0.44	119.76	-0.44	119.76	90.21	0.48
6100.00	0.20	170.86	6096.47	-0.86	119.82	-0.86	119.82	90.41	0.09



VES Survey International
West Texas
(432) 563-5444
Surveyor: Adam Gathright
Dump Yard 2 State No. 002H / API 30-015-42518



COG OPERATING, LLC

Eddy County, NM

Dumpyard 2 State 2H

2H

Lateral

Design: Surveys

Standard Survey Report

25 September, 2014

Archer

Survey Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well 2H
Project:	Eddy County, NM	TVD Reference:	3376'GL+17'KB @ 3393.00usft (Planning)
Site:	Dumpyard 2 State 2H	MD Reference:	3376'GL+17'KB @ 3393.00usft (Planning)
Well:	2H	North Reference:	Grid
Wellbore:	Lateral	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM R5000.1 MULTI

Project	Eddy County, NM		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site	Dumpyard 2 State 2H		
Site Position:		Northing:	546,612.00 usft
From:	Map	Easting:	584,352.00 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13.200 in
		Latitude:	32° 30' 8.82 N
		Longitude:	104° 3' 35.00 W
		Grid Convergence:	0.15 °

Well	2H		
Well Position	+N/-S	0.00 usft	Northing: 546,612.00 usft
	+E/-W	0.00 usft	Easting: 584,352.00 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 30' 8.82 N
		Longitude:	104° 3' 35.00 W
		Ground Level:	3,376.00 usft

Wellbore	Lateral		
Magnetics	Model Name	Sample Date	Declination
	IGRF2010	8/6/2014	(°)
			7.45
			Dip Angle (°)
			60.28
			Field Strength (nT)
			48,417

Design	Surveys		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.00	0.00	0.00
			Direction (°)
			359.35

Survey Program	Date: 9/25/2014		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
100.00	2,700.00	Survey #1 (Lateral)	NS-GYRO-MS
2,800.00	6,100.00	Survey #3 (Lateral)	NS-GYRO-MS
6,132.00	14,784.00	Survey #4 (Lateral)	MWD
14,869.00	14,869.00	Survey #5 (Lateral)	Project
			Description
			Gyrocompass Gyro
			Gyrocompass Gyro
			MWD - Standard
			Projection

Survey									
Measured Depth	Inclination	Azimuth	Vertical Depth	+N/-S	+E/-W	Vertical Section	Dogleg Rate	Build Rate	Turn Rate
(usft)	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(°/100usft)	(°/100usft)	(°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.20	226.38	100.00	-0.12	-0.13	-0.12	0.20	0.20	0.00
200.00	0.06	75.15	200.00	-0.23	-0.20	-0.23	0.25	-0.14	-151.23
300.00	0.03	220.42	300.00	-0.23	-0.17	-0.23	0.09	-0.03	145.27
400.00	0.51	233.58	400.00	-0.52	-0.54	-0.51	0.48	0.48	13.16
500.00	0.81	174.31	499.99	-1.49	-0.83	-1.48	0.70	0.30	-59.27
600.00	1.03	123.25	599.98	-2.68	-0.01	-2.68	0.82	0.22	-51.06
700.00	0.38	138.62	699.97	-3.42	0.96	-3.43	0.67	-0.65	15.37

Archer Survey Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well 2H
Project:	Eddy County, NM	TVD Reference:	3376'GL+17'KB @ 3393.00usft (Planning)
Site:	Dumpyard 2 State 2H	MD Reference:	3376'GL+17'KB @ 3393.00usft (Planning)
Well:	2H	North Reference:	Grid
Wellbore:	Lateral	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM R5000.1 MULTI

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
800.00	0.11	117.15	799.97	-3.72	1.27	-3.73	0.28	-0.27	-21.47
900.00	0.12	214.73	899.97	-3.85	1.29	-3.86	0.17	0.01	97.58
1,000.00	0.07	230.59	999.97	-3.97	1.18	-3.98	0.06	-0.05	15.86
1,100.00	0.32	358.23	1,099.97	-3.73	1.13	-3.74	0.37	0.25	127.64
1,200.00	0.46	55.57	1,199.97	-3.22	1.45	-3.24	0.39	0.14	57.34
1,300.00	0.44	23.83	1,299.97	-2.65	1.94	-2.67	0.25	-0.02	-31.74
1,400.00	0.11	300.47	1,399.97	-2.25	2.01	-2.27	0.44	-0.33	-83.36
1,500.00	0.17	355.80	1,499.97	-2.05	1.92	-2.07	0.14	0.06	55.33
1,600.00	0.13	87.53	1,599.96	-1.90	2.02	-1.92	0.22	-0.04	91.73
1,700.00	0.04	112.35	1,699.96	-1.91	2.16	-1.93	0.10	-0.09	24.82
1,800.00	0.08	101.40	1,799.96	-1.93	2.27	-1.96	0.04	0.04	-10.95
1,900.00	0.15	77.99	1,899.96	-1.92	2.46	-1.95	0.08	0.07	-23.41
2,000.00	0.15	20.20	1,999.96	-1.77	2.63	-1.80	0.14	0.00	-57.79
2,100.00	0.14	0.51	2,099.96	-1.52	2.68	-1.55	0.05	-0.01	-19.69
2,200.00	0.24	338.23	2,199.96	-1.21	2.60	-1.24	0.12	0.10	-22.28
2,300.00	0.12	11.47	2,299.96	-0.91	2.55	-0.94	0.15	-0.12	33.24
2,400.00	0.10	278.44	2,399.96	-0.79	2.48	-0.82	0.16	-0.02	-93.03
2,500.00	0.12	3.49	2,499.96	-0.68	2.40	-0.70	0.15	0.02	85.05
2,600.00	0.07	153.72	2,599.96	-0.63	2.44	-0.65	0.18	-0.05	150.23
2,700.00	0.09	265.59	2,699.96	-0.69	2.38	-0.72	0.13	0.02	111.87
2,800.00	0.27	155.23	2,799.96	-0.91	2.40	-0.94	0.31	0.18	-110.36
2,900.00	0.22	38.09	2,899.96	-0.97	2.62	-1.00	0.42	-0.05	-117.14
3,000.00	0.22	58.68	2,999.96	-0.72	2.90	-0.75	0.08	0.00	20.59
3,100.00	1.07	65.06	3,099.95	-0.23	3.91	-0.27	0.85	0.85	6.38
3,200.00	2.15	85.27	3,199.91	0.32	6.63	0.25	1.20	1.08	20.21
3,300.00	3.58	92.02	3,299.79	0.37	11.62	0.23	1.47	1.43	6.75
3,400.00	3.58	86.65	3,399.59	0.44	17.86	0.24	0.34	0.00	-5.37
3,500.00	3.70	90.21	3,499.39	0.61	24.20	0.33	0.26	0.12	3.56
3,600.00	4.24	90.18	3,599.15	0.59	31.12	0.23	0.54	0.54	-0.03
3,700.00	4.02	86.75	3,698.89	0.77	38.32	0.34	0.33	-0.22	-3.43
3,800.00	3.16	89.50	3,798.69	1.00	44.58	0.49	0.88	-0.86	2.75
3,900.00	2.94	85.15	3,898.55	1.24	49.89	0.67	0.32	-0.22	-4.35
4,000.00	3.05	83.87	3,998.41	1.74	55.09	1.11	0.13	0.11	-1.28
4,100.00	3.04	86.49	4,098.27	2.18	60.38	1.50	0.14	-0.01	2.62
4,200.00	3.03	89.68	4,198.13	2.36	65.67	1.62	0.17	-0.01	3.19
4,300.00	3.63	92.61	4,297.96	2.23	71.48	1.42	0.62	0.60	2.93
4,400.00	3.88	91.90	4,397.75	1.98	78.02	1.09	0.25	0.25	-0.71
4,500.00	3.25	97.49	4,497.56	1.49	84.21	0.54	0.72	-0.63	5.59
4,600.00	3.33	95.61	4,597.39	0.84	89.91	-0.18	0.13	0.08	-1.88
4,700.00	3.47	94.86	4,697.21	0.30	95.82	-0.79	0.15	0.14	-0.75
4,800.00	2.89	95.68	4,797.06	-0.21	101.34	-1.36	0.58	-0.58	0.82
4,900.00	2.82	92.21	4,896.94	-0.55	106.31	-1.76	0.19	-0.07	-3.47
5,000.00	2.50	92.89	4,996.83	-0.76	110.95	-2.01	0.32	-0.32	0.68

Archer

Survey Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well 2H
Project:	Eddy County, NM	TVD Reference:	3376'GL+17'KB @ 3393.00usft (Planning)
Site:	Dumpyard 2 State 2H	MD Reference:	3376'GL+17'KB @ 3393.00usft (Planning)
Well:	2H	North Reference:	Grid
Wellbore:	Lateral	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM R5000.1 MULTI

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,100.00	2.68	93.53	5,096.73	-1.01	115.46	-2.32	0.18	0.18	0.64
5,200.00	2.60	94.71	5,196.62	-1.34	120.05	-2.70	0.10	-0.08	1.18
5,300.00	1.62	119.86	5,296.55	-2.23	123.54	-3.63	1.33	-0.98	25.15
5,400.00	0.45	88.89	5,396.54	-2.93	125.16	-4.34	1.26	-1.17	-30.97
5,500.00	0.32	70.70	5,496.53	-2.83	125.81	-4.25	0.18	-0.13	-18.19
5,600.00	0.89	300.59	5,596.53	-2.34	125.41	-3.76	1.12	0.57	-130.11
5,700.00	1.45	292.03	5,696.51	-1.47	123.57	-2.87	0.59	0.56	-8.56
5,800.00	1.34	285.54	5,796.48	-0.68	121.27	-2.06	0.19	-0.11	-6.49
5,900.00	0.26	294.46	5,896.47	-0.27	119.93	-1.63	1.08	-1.08	8.92
6,000.00	0.29	172.36	5,996.47	-0.43	119.76	-1.79	0.48	0.03	-122.10
6,100.00	0.20	170.86	6,096.47	-0.85	119.82	-2.21	0.09	-0.09	-1.50
6,132.00	0.50	207.90	6,128.47	-1.03	119.77	-2.39	1.13	0.94	115.75
6,227.00	0.40	218.10	6,223.46	-1.66	119.37	-3.01	0.13	-0.11	10.74
6,322.00	0.50	201.70	6,318.46	-2.30	119.01	-3.65	0.17	0.11	-17.26
6,417.00	0.70	242.60	6,413.45	-2.96	118.34	-4.30	0.48	0.21	43.05
6,511.00	0.70	270.40	6,507.45	-3.22	117.26	-4.55	0.36	0.00	29.57
6,606.00	0.70	247.80	6,602.44	-3.43	116.14	-4.75	0.29	0.00	-23.79
6,702.00	0.70	337.40	6,698.44	-3.11	115.37	-4.42	1.03	0.00	93.33
6,796.00	1.40	1.70	6,792.42	-1.43	115.18	-2.74	0.87	0.74	25.85
6,891.00	1.20	1.50	6,887.40	0.72	115.24	-0.59	0.21	-0.21	-0.21
6,985.00	1.30	322.00	6,981.38	2.54	114.61	1.24	0.90	0.11	-42.02
7,080.00	1.30	292.80	7,076.35	3.81	112.96	2.53	0.69	0.00	-30.74
7,176.00	0.90	307.30	7,172.33	4.69	111.35	3.43	0.50	-0.42	15.10
7,271.00	0.90	285.70	7,267.32	5.34	110.04	4.09	0.36	0.00	-22.74
7,366.00	0.70	250.40	7,362.31	5.35	108.78	4.12	0.55	-0.21	-37.16
7,461.00	1.20	223.90	7,457.30	4.44	107.54	3.22	0.69	0.53	-27.89
7,524.00	1.10	227.30	7,520.29	3.55	106.64	2.34	0.19	-0.16	5.40
7,594.00	1.10	236.60	7,590.28	2.73	105.58	1.53	0.25	0.00	13.29
7,626.00	1.40	277.30	7,622.27	2.61	104.94	1.42	2.86	0.94	127.19
7,657.00	2.50	315.60	7,653.25	3.14	104.09	1.96	5.32	3.55	123.55
7,689.00	4.60	343.40	7,685.19	4.87	103.24	3.70	8.30	6.56	86.88
7,721.00	7.20	352.20	7,717.02	8.09	102.60	6.92	8.58	8.13	27.50
7,753.00	10.00	357.20	7,748.66	12.85	102.19	11.69	9.05	8.75	15.63
7,784.00	13.10	2.20	7,779.03	19.05	102.19	17.89	10.50	10.00	16.13
7,816.00	16.50	2.50	7,809.96	27.22	102.53	26.05	10.63	10.63	0.94
7,848.00	19.40	1.70	7,840.40	37.07	102.89	35.90	9.09	9.06	-2.50
7,880.00	21.70	0.10	7,870.36	48.30	103.05	47.13	7.40	7.19	-5.00
7,911.00	23.00	358.70	7,899.03	60.09	102.93	58.91	4.53	4.19	-4.52
7,943.00	24.70	357.80	7,928.30	73.02	102.53	71.85	5.43	5.31	-2.81
7,975.00	26.90	359.40	7,957.11	86.94	102.19	85.77	7.21	6.88	5.00
8,006.00	28.60	1.70	7,984.54	101.37	102.34	100.20	6.48	5.48	7.42
8,038.00	31.10	3.00	8,012.29	117.28	103.00	116.11	8.07	7.81	4.06
8,069.00	34.30	3.60	8,038.38	134.00	103.97	132.81	10.38	10.32	1.94
8,101.00	37.50	3.60	8,064.30	152.72	105.15	151.52	10.00	10.00	0.00

Archer

Survey Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well 2H
Project:	Eddy County, NM	TVD Reference:	3376'GL+17'KB @ 3393.00usft (Planning)
Site:	Dumphyard 2 State 2H	MD Reference:	3376'GL+17'KB @ 3393.00usft (Planning)
Well:	2H	North Reference:	Grid
Wellbore:	Lateral	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM R5000.1 MULTI

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,133.00	40.50	3.20	8,089.16	172.82	106.34	171.61	9.41	9.38	-1.25
8,164.00	43.50	3.00	8,112.20	193.53	107.46	192.30	9.69	9.68	-0.65
8,196.00	46.00	3.20	8,134.92	216.03	108.68	214.78	7.82	7.81	0.63
8,227.00	47.70	3.70	8,156.12	238.60	110.04	237.34	5.61	5.48	1.61
8,258.00	50.30	3.90	8,176.46	261.94	111.59	260.66	8.40	8.39	0.65
8,290.00	53.40	3.70	8,196.22	287.05	113.26	285.75	9.70	9.69	-0.63
8,322.00	56.00	3.10	8,214.71	313.12	114.81	311.80	8.27	8.13	-1.88
8,354.00	58.50	3.00	8,232.02	339.99	116.24	338.65	7.82	7.81	-0.31
8,386.00	61.00	2.70	8,248.14	367.60	117.61	366.24	7.85	7.81	-0.94
8,417.00	63.70	2.40	8,262.53	395.03	118.83	393.65	8.75	8.71	-0.97
8,449.00	66.40	1.90	8,276.02	424.02	119.92	422.63	8.56	8.44	-1.56
8,480.00	68.70	1.80	8,287.86	452.65	120.84	451.25	7.43	7.42	-0.32
8,512.00	71.70	2.00	8,298.70	482.74	121.84	481.33	9.39	9.38	0.63
8,544.00	75.00	1.80	8,307.87	513.38	122.86	511.95	10.33	10.31	-0.63
8,575.00	78.00	2.40	8,315.10	543.50	123.96	542.06	9.86	9.68	1.94
8,607.00	81.10	2.50	8,320.91	574.93	125.31	573.48	9.69	9.69	0.31
8,680.00	88.40	1.00	8,327.58	647.54	127.52	646.05	10.21	10.00	-2.05
8,726.00	89.30	1.30	8,328.50	693.52	128.44	692.02	2.06	1.96	0.65
8,820.00	91.10	1.30	8,328.18	787.49	130.58	785.96	1.91	1.91	0.00
8,915.00	90.40	1.00	8,326.93	882.47	132.48	880.91	0.80	-0.74	-0.32
9,010.00	89.80	2.20	8,326.77	977.43	135.14	975.83	1.41	-0.63	1.26
9,105.00	88.30	2.50	8,328.34	1,072.33	139.03	1,070.69	1.61	-1.58	0.32
9,201.00	90.10	3.00	8,329.68	1,168.21	143.63	1,166.50	1.95	1.88	0.52
9,296.00	88.70	1.10	8,330.68	1,263.14	147.03	1,261.39	2.48	-1.47	-2.00
9,392.00	89.00	359.60	8,332.60	1,359.11	147.62	1,357.35	1.59	0.31	-1.56
9,488.00	89.40	357.10	8,333.94	1,455.05	144.86	1,453.32	2.64	0.42	-2.60
9,583.00	91.50	357.20	8,333.20	1,549.93	140.13	1,548.24	2.21	2.21	0.11
9,679.00	91.10	355.50	8,331.02	1,645.71	134.02	1,644.08	1.82	-0.42	-1.77
9,775.00	90.10	356.20	8,330.01	1,741.45	127.08	1,739.89	1.27	-1.04	0.73
9,870.00	88.80	356.80	8,330.93	1,836.26	121.28	1,834.77	1.51	-1.37	0.63
9,966.00	90.90	357.00	8,331.18	1,932.12	116.09	1,930.67	2.20	2.19	0.21
10,062.00	89.90	356.00	8,330.51	2,027.93	110.22	2,026.55	1.47	-1.04	-1.04
10,157.00	88.40	355.90	8,331.92	2,122.68	103.52	2,121.37	1.58	-1.58	-0.11
10,253.00	90.50	356.00	8,332.84	2,218.43	96.74	2,217.19	2.19	2.19	0.10
10,349.00	90.20	356.70	8,332.25	2,314.24	90.63	2,313.06	0.79	-0.31	0.73
10,444.00	89.60	357.10	8,332.42	2,409.10	85.49	2,407.97	0.76	-0.63	0.42
10,540.00	91.70	357.20	8,331.33	2,504.97	80.72	2,503.89	2.19	2.19	0.10
10,636.00	90.40	357.80	8,329.57	2,600.86	76.53	2,599.82	1.49	-1.35	0.63
10,731.00	89.10	357.70	8,329.98	2,695.78	72.80	2,694.78	1.37	-1.37	-0.11
10,827.00	90.80	358.50	8,330.07	2,791.72	69.62	2,790.75	1.96	1.77	0.83
10,923.00	89.00	358.60	8,330.24	2,887.69	67.19	2,886.74	1.88	-1.88	0.10
11,018.00	90.80	358.80	8,330.40	2,982.66	65.03	2,981.73	1.91	1.89	0.21
11,114.00	89.20	357.30	8,330.40	3,078.60	61.77	3,077.70	2.28	-1.67	-1.56

Archer

Survey Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well 2H
Project:	Eddy County, NM	TVD Reference:	3376'GL+17'KB @ 3393.00usft (Planning)
Site:	Dumppyard 2 State 2H	MD Reference:	3376'GL+17'KB @ 3393.00usft (Planning)
Well:	2H	North Reference:	Grid
Wellbore:	Lateral	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM R5000.1 MULTI

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
11,209.00	90.90	357.50	8,330.32	3,173.50	57.46	3,172.64	1.80	1.79	0.21
11,305.00	90.60	357.70	8,329.06	3,269.40	53.44	3,268.59	0.38	-0.31	0.21
11,401.00	89.80	358.30	8,328.73	3,365.34	50.09	3,364.56	1.04	-0.83	0.63
11,497.00	89.50	358.30	8,329.31	3,461.30	47.24	3,460.54	0.31	-0.31	0.00
11,592.00	91.30	358.80	8,328.65	3,556.26	44.83	3,555.52	1.97	1.89	0.53
11,688.00	90.10	358.10	8,327.48	3,652.22	42.24	3,651.50	1.45	-1.25	-0.73
11,784.00	88.00	357.80	8,329.07	3,748.14	38.80	3,747.46	2.21	-2.19	-0.31
11,879.00	89.50	358.80	8,331.14	3,843.07	35.99	3,842.41	1.90	1.58	1.05
11,975.00	91.40	359.40	8,330.39	3,939.05	34.48	3,938.40	2.08	1.98	0.63
12,038.00	90.70	358.20	8,329.23	4,002.02	33.16	4,001.39	2.20	-1.11	-1.90
12,102.00	91.30	358.80	8,328.12	4,065.99	31.49	4,065.37	1.33	0.94	0.94
12,198.00	89.20	358.90	8,327.70	4,161.97	29.56	4,161.36	2.19	-2.19	0.10
12,293.00	88.80	359.80	8,329.36	4,256.94	28.48	4,256.35	1.04	-0.42	0.95
12,389.00	89.20	0.50	8,331.03	4,352.93	28.73	4,352.32	0.84	0.42	0.73
12,456.00	89.40	1.30	8,331.85	4,419.91	29.78	4,419.29	1.23	0.30	1.19
12,545.00	90.50	0.20	8,331.93	4,508.90	30.95	4,508.26	1.75	1.24	-1.24
12,638.00	92.40	358.60	8,329.57	4,601.86	29.98	4,601.23	2.67	2.04	-1.72
12,734.00	91.80	358.30	8,326.06	4,697.76	27.38	4,697.15	0.70	-0.63	-0.31
12,829.00	94.30	357.90	8,321.00	4,792.57	24.24	4,791.98	2.66	2.63	-0.42
12,925.00	94.80	357.10	8,313.39	4,888.17	20.06	4,887.63	0.98	0.52	-0.83
13,021.00	94.30	357.00	8,305.77	4,983.74	15.14	4,983.25	0.53	-0.52	-0.10
13,117.00	93.50	357.20	8,299.24	5,079.40	10.29	5,078.95	0.86	-0.83	0.21
13,213.00	90.10	357.20	8,296.23	5,175.22	5.61	5,174.82	3.54	-3.54	0.00
13,308.00	89.70	356.70	8,296.39	5,270.09	0.55	5,269.74	0.67	-0.42	-0.53
13,404.00	90.90	356.10	8,295.89	5,365.89	-5.48	5,365.61	1.40	1.25	-0.63
13,499.00	91.40	355.90	8,293.98	5,460.64	-12.10	5,460.43	0.57	0.53	-0.21
13,595.00	91.50	355.30	8,291.55	5,556.33	-19.46	5,556.19	0.63	0.10	-0.63
13,691.00	90.20	354.90	8,290.13	5,651.96	-27.66	5,651.91	1.42	-1.35	-0.42
13,787.00	88.70	354.80	8,291.05	5,747.57	-36.28	5,747.61	1.57	-1.56	-0.10
13,882.00	88.90	355.40	8,293.04	5,842.20	-44.39	5,842.33	0.67	0.21	0.63
13,977.00	87.90	356.10	8,295.69	5,936.90	-51.43	5,937.10	1.28	-1.05	0.74
14,072.00	86.50	357.10	8,300.33	6,031.62	-57.06	6,031.88	1.81	-1.47	1.05
14,167.00	87.80	357.50	8,305.06	6,126.39	-61.53	6,126.70	1.43	1.37	0.42
14,262.00	88.40	357.20	8,308.21	6,221.24	-65.92	6,221.59	0.71	0.63	-0.32
14,356.00	87.20	357.70	8,311.81	6,315.07	-70.10	6,315.46	1.38	-1.28	0.53
14,451.00	88.50	357.40	8,315.38	6,409.92	-74.15	6,410.35	1.40	1.37	-0.32
14,546.00	89.60	357.70	8,316.95	6,504.82	-78.21	6,505.28	1.20	1.16	0.32
14,641.00	89.40	357.60	8,317.78	6,599.73	-82.11	6,600.24	0.24	-0.21	-0.11
14,735.00	90.50	357.80	8,317.86	6,693.66	-85.88	6,694.20	1.19	1.17	0.21
14,784.00	91.20	357.50	8,317.14	6,742.61	-87.89	6,743.17	1.55	1.43	-0.61
14,869.00	91.20	357.50	8,315.36	6,827.51	-91.60	6,828.11	0.00	0.00	0.00

Archer

Survey Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well 2H
Project:	Eddy County, NM	TVD Reference:	3376'GL+17'KB @ 3393.00usft (Planning)
Site:	Dumyard 2 State 2H	MD Reference:	3376'GL+17'KB @ 3393.00usft (Planning)
Well:	2H	North Reference:	Grid
Wellbore:	Lateral	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM R5000.1 MULTI

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
- Shape									
Dumyard 2-2H Surface	0.00	0.00	0.00	0.00	0.00	546,612.00	584,352.00	32° 30' 8.82 N	104° 3' 35.00 W
- actual wellpath hits target center									
- Point									
Dumyard 2-2H BHL	0.00	0.00	8,315.36	6,827.51	-91.60	553,439.51	584,260.40	32° 31' 16.38 N	104° 3' 35.87 W
- actual wellpath hits target center									
- Point									

COG OPERATING, LLC

Field: Eddy County, NM
Site: Dumpyard 2 State 2H
Well: 2H
Wellbore: Lateral
Plan: Surveys



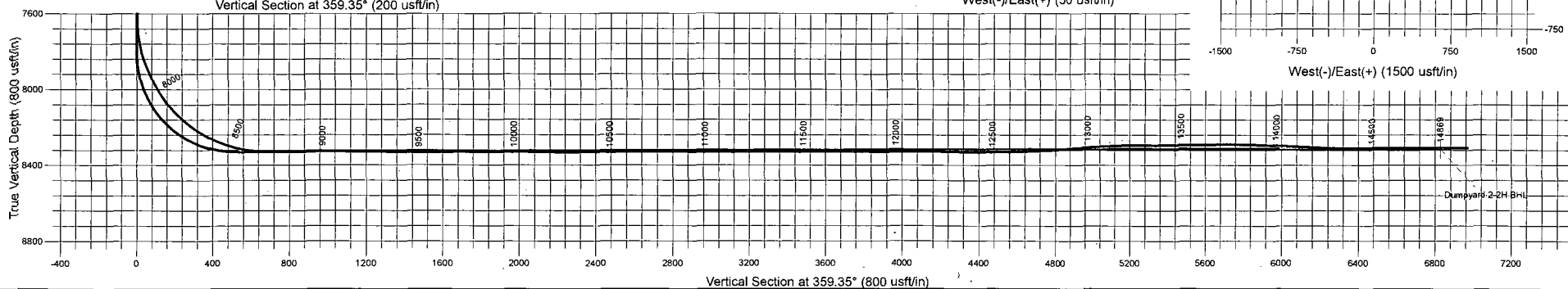
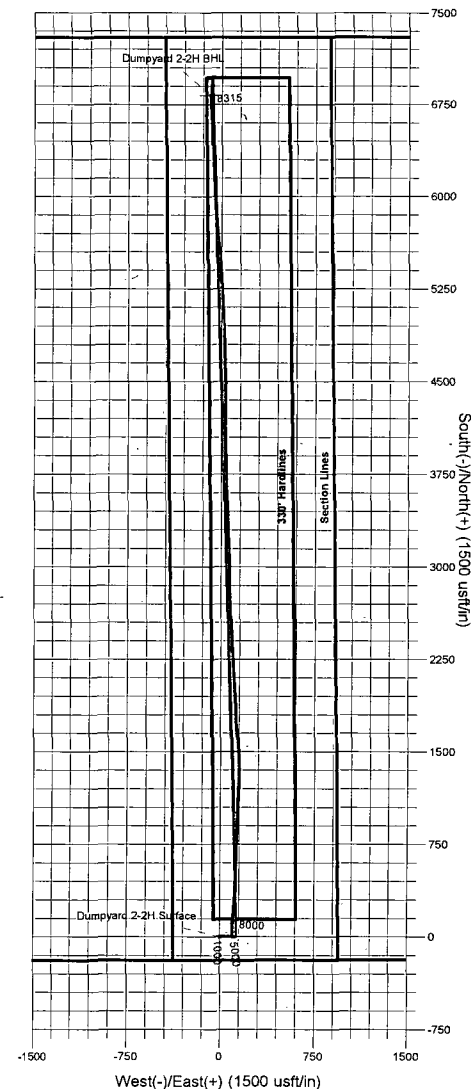
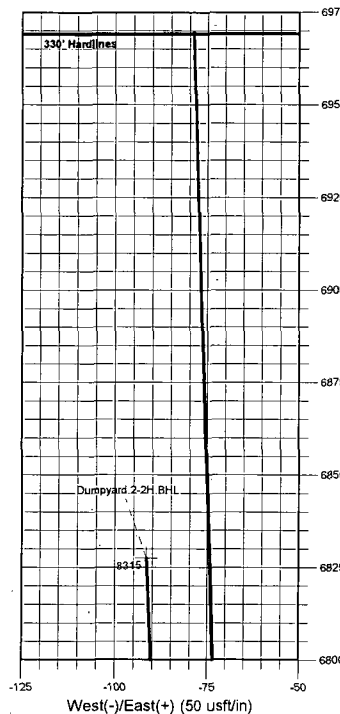
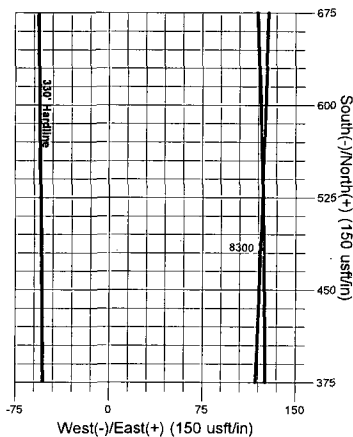
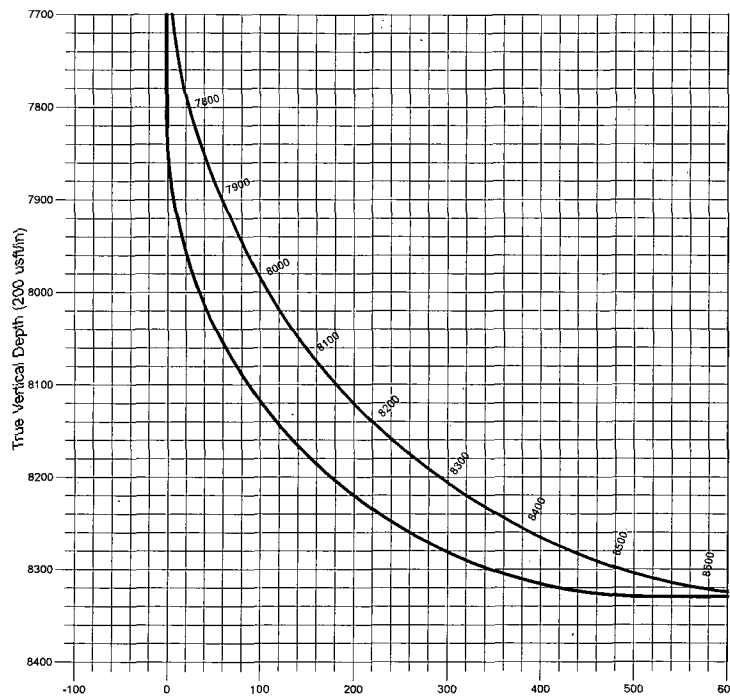
TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
Dumpyard 2-2H Surface	0.00	0.00	0.00	546612.00	584352.00	32° 30' 8.82 N	104° 3' 35.00 W	Point
Dumpyard 2-2H BHL	8315.36	6827.51	-91.60	553439.51	584260.40	32° 31' 16.38 N	104° 3' 35.87 W	Point



Azimuths to Grid North
True North: -0.15°
Magnetic North: 7.30°

Magnetic Field
Strength: 48416.8snT
Dip Angle: 60.28°
Date: 8/6/2014
Model: IGRF2010



Archer

ARCHER DIRECTIONAL DRILLING SERVICES
12101 Cutten Rd. Houston, Texas 77066
Phone: 281-301-2600 Fax: 281-301-2795

Design: Surveys (2H/Lateral)
Created By: Ivonne Gonzalez
Date: 14:54, September 25 2014